

Kennecott Corporation
10 East South Temple
P.O. Box 11248
Salt Lake City, UT 84147
(801) 322-6442

Robert R. Dimock, Jr.
Vice President
Project Development

Kennecott

7 January 1991

Mr. Kent Gray, Director
Bureau of Emergency Response and Remediation
State of Utah
P.O. Box 16690
280 North 1460 West
Salt Lake City, Utah 84116

Re: Removal of Historic Tailings Materials from the Bingham Creek
Channel; Summary Report, Field Program

Dear Mr. Gray:

As you know, on October 29, 1990, Kennecott Corporation offered to work with the State of Utah to remove deposits of lead and arsenic contaminated historic tailings materials from the portions of the Bingham Creek channel lying outside the Company's property. This offer contemplated a removal during the late fall and early winter of 1990, and Kennecott's offer was made subject to certain access and disposal requirements. Though the cleanup of these materials is not Kennecott's legal duty or responsibility, it volunteered to undertake this program in an effort to assist the community and the State, given Kennecott's proximity to the area of concern, expertise in materials handling, and desire to see this problem resolved quickly.

Given their location, appearance and chemistry, the tailings materials of concern are obviously the product of historic lead mining and milling operations upstream of the Bingham Creek channel during the late 1800s and early 1900s. The practice at that time was to place mill tailings in Bingham Creek for disposal. Normal creek flow, spring rains and other floods would scour the creek channel and transport the tails downstream. The legacy of this practice is the current situation, visually discrete pockets of tailings materials in the downstream channel which dropped out of the stream principally at bends and backwaters of the creek's historic flow.

Beginning on November 12 and ending on December 5, 1990, Kennecott Corporation conducted a field program on its property to demonstrate removal of historic tailings materials from the channel of Bingham Creek, as well as to test various aspects of that program. This program was undertaken after discussions with the Utah Department

0003

Mr. Kent Gray
7 January 1991

Page 2

of Health on the issue of the clean up of the Bingham Creek Channel. The Department has requested a report on the program results. This letter contains a summary of the program and its findings.

The purpose of this program was to demonstrate the feasibility of excavating the discrete areas of historic tailings materials found in the channel of Bingham Creek. The goal of this test program was to provide information needed to make an efficient full-scale excavation of these materials regardless of who has responsibility to perform the removal. We believe it succeeded.

Activities performed during the field program were consistent with other, similar removal actions in terms of removal equipment, personnel protection, exposure monitoring, sampling and analytical procedures. The specific activities of the program included the following:

- o Demonstration of different excavation techniques and equipment types for productivity and effectiveness.
- o Demonstration of the viability of access and transportation concepts.
- o Demonstration of dust control methods.
- o Determination of personnel protection methods, limits and procedures.
- o Determination of residual soil contaminant levels.

This program was started on November 12, 1990, and lasted 14 work days. A total of 8,450 cubic yards of tailings and over excavation soils were removed from four (4) work areas. The tailings material was transported and placed in a stockpile (temporary repository) upstream, within the channel. The four (4) work areas were selected based on mapping, trenching, sampling and assaying of the tailings and the depositional characteristics of the material. Please refer to the attached drawing "Field Demonstration Program General Layout."

The first work area, Area "A" was characterized by a fairly wide channel with tailings deposits extending outside of the apparent channel depression. This is typical of the bulk deposits found upstream on Kennecott property. The three remaining work areas were designated Areas "B1", "B2", "B3" and were selected because their steep walls and narrow channel were unique and difficult to access and excavate.

Mr. Kent Gray
7 January 1991

Page 3

The initial findings of the field program were:

- The majority of material can be removed with a tracked excavator, fitted with a cutting-edge bucket. This equipment should be supported with small dozers, graders, and water trucks.
- The excavator can operate effectively from either bank of the creek to access material lying across the width of the channel.
- Haul roads should be located on top of the bank whenever possible.
- Haulage equipment was effectively decontaminated with brooms and shovels after loading.
- Clean-up of spillage on haul roads was accomplished by removing the top 2" - 4" of material to the stockpile.
- Level 'D' (Basic OSHA Construction Safety Equipment uniformly used at construction sites) personnel protection was proven adequate for workers engaged in these removal activities. Level "C" protection (Level "D" plus half-face respirators, coveralls, gloves and special hygiene requirements) were initially employed as a precautionary measure due to working condition uncertainties. Data from ambient and personnel monitors demonstrated that the reduction from Level "C" to Level "D" was appropriate.
- Removal of the contaminated material was accomplished by excavation of visually identifiable tailings, and 6" of over-excavation for soils on the channel sides, and 12" over-excavation for soils in the channel bottom. This action reduced contamination levels in the post removal areas by more than an order of magnitude. The residual contamination level is subsequently reduced further by recontouring the areas.

Based on the preliminary findings of the field program, it is concluded that the techniques developed are an effective means of removing historic tailings in the Bingham Creek Channel and diminishing the health hazards that might be associated therewith.

Mr. Kent Gray
7 January 1991

Page 4

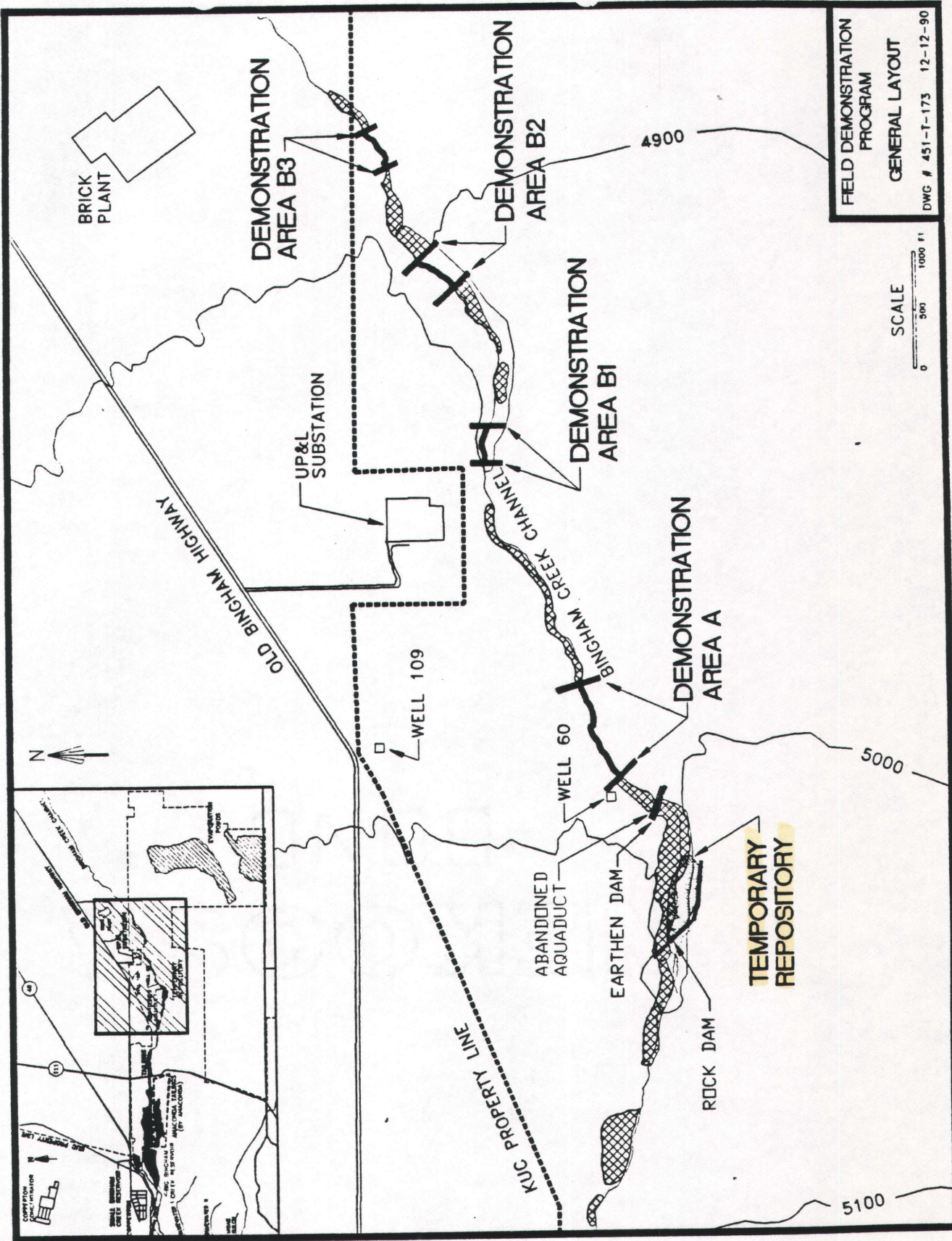
In order to gain a full appreciation of the field program findings, we believe it would be to our mutual benefit for you to visit the site. This would allow you to observe first hand the completed work in the various types of terrain. Please call Bart Van Dyken at 569-6858 to arrange such a visit. We would value your observations and thoughts on these activities.

If you or any members of your staff would like to review our findings in more detail, please give me a call and we can set up a meeting with the appropriate people.

Yours truly,

R. R. Dimock

/mf



FIELD DEMONSTRATION PROGRAM
GENERAL LAYOUT
DWG # 451-T-173 12-12-90

SCALE
0 500 1000 ft